

# PLACES\*: A Tool for Sustainable Land Use

Verle Hansen, PhD  
USEPA/ORD/NRMRL/LRPCD  
26 West Martin Luther King Drive  
Cincinnati, Ohio 45202

[hansen.verle@epa.gov](mailto:hansen.verle@epa.gov)

\* Planning Land And Communities to be Environmentally Sustainable

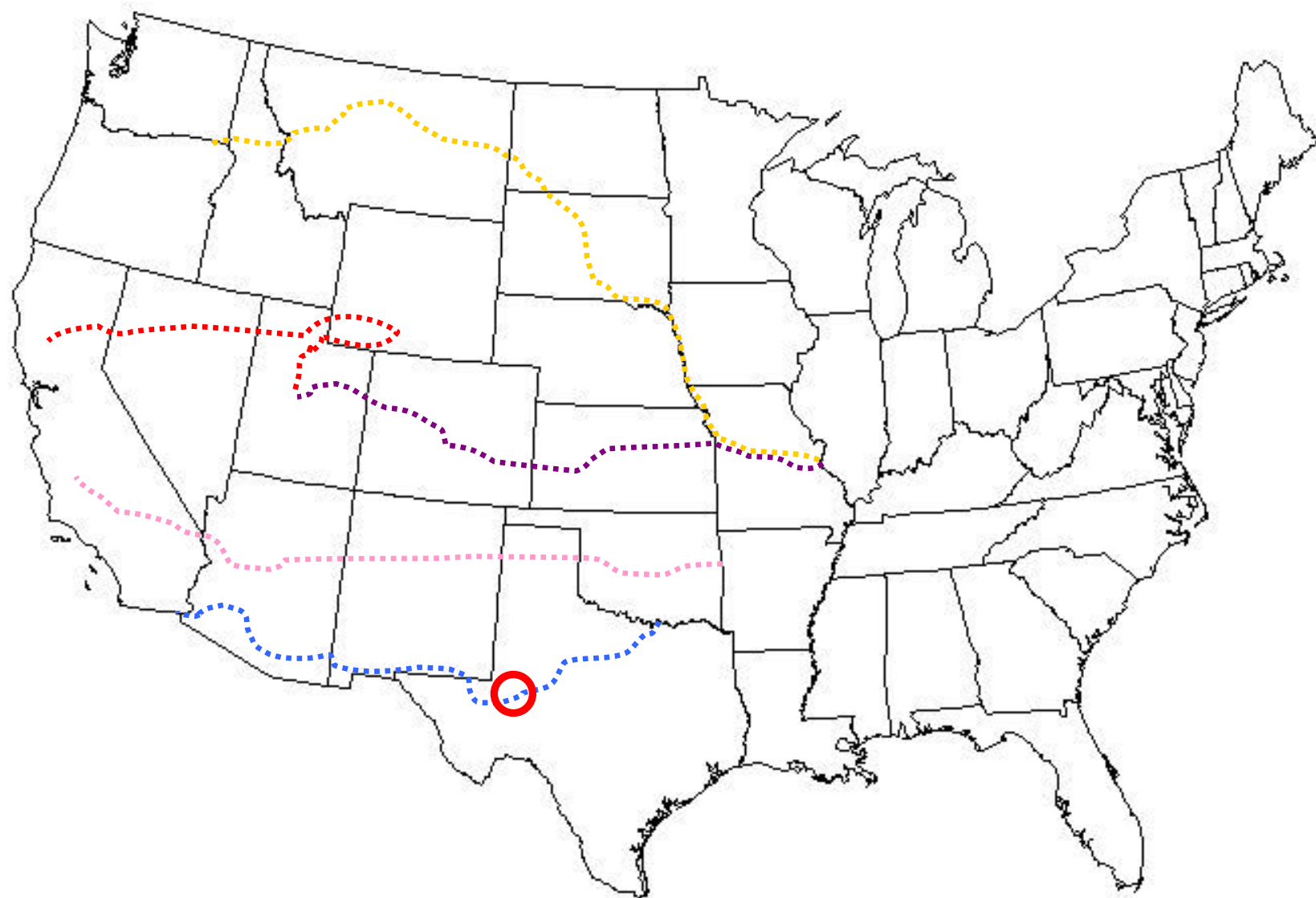






Image NMRGIS  
© 2009 Europa Technologies  
Image USDA Farm Service Agency  
© 2009 Google

2008 Google

Imagery Dates: Jun 28, 2005 - Jul 2005

31°59'52.81" N 103°59'08.52" W elev 2864 ft

Eye alt 8540 ft



## Sustainability applies to Systems

"Many of the world's biggest rivers, including the Nile, Ganges, Yangtze and Danube, are facing catastrophic collapse due to man-made problems, .... A wasteful attitude to water use and inadequate protection of rivers has destroyed ecosystems while threatening the livelihoods of people living in river basins."

"We're talking about a complete collapse of the system -- they're so polluted, so over-extracted or so cut up by dams that it's really not functioning as a river any more." Tom le Quesne, freshwater policy officer, WWF-UK

- 
1. **Functioning systems are lost at site level.**
  2. **Functioning systems can not be achieved at site level.**



# Themes

## Sustainable Communities

### LOCAL GOVERNMENT LEVEL

Sustainable Communities	Themes																																												
	Environment (& Nature)	Water (& Stormwater)	Air Quality	Urban Forests (& Biodiversity)	Resource Management	Infrastructure & Utilities	Waste Management (& Resource Recovery)	Hazardous Materials (& Risk Management)	Green Building	Energy (& Renewable Energy)	Climate Protection (& Ozone Depletion)	Transportation (& Mobility)	Ports & Marinas	Green Fleets	Land Use	Brownfield Redevelopment	Parks, Open space & Recreation	Leadership & Innovation	Government Operations & Administration	Education & Outreach	Tax Collection & Property Appraisal	Economy (& Economic Development)	Tourism & Hospitality	Retirement Economy	Clean Technologies	Local Food (& Agriculture)	Health (& Access to Health Care)	Healthy Community (Neighborhoods)	Public Safety	Emergency Management	Arts & Culture	Society (Civic Vitality & Engagement)	Social Equity	Environmental Justice	Human Services	Affordable (& Workforce Housing)	Employment & Workforce Development	Poverty & Homelessness	Educational Excellence (& Child Development)	Human Capital (& Social Well-Being)	Youth (Wellness & Life Skills)				
LOCAL GOVERNMENT LEVEL																																													
Albuquerque, NM																																													
Austin, TX																																													
Boston, MA																																													
Burlington, VT																																													
Cape Cod, MA																																													
Chicago, IL																																													
Denver, CO																																													
Jacksonville, FL																																													
Marin County, CA																																													
Milwaukee, WI																																													
Minneapolis, MN																																													
New York, NY																																													
Northampton, MA																																													
Olympia, WA																																													
Pittsburgh, PA																																													
Plano, TX																																													
Portland, OR																																													
Racine, WI																																													
Salt Lake City, UT																																													
San Francisco, CA																																													
Santa Barbara, CA																																													
Santa Monica, CA																																													
Seattle, WA																																													
Seattle, WA																																													
Seattle, WA																																													
Sierra Nevada																																													
Tucson, AZ																																													
SustainLane																																													

Differ on goals

No common understanding of terms

No standards

No common measurement of progress

Actions may be by consensus, but Conditions are enforced by Nature.

Slide adapted from ICLEI –permission to use by Lynne Barker

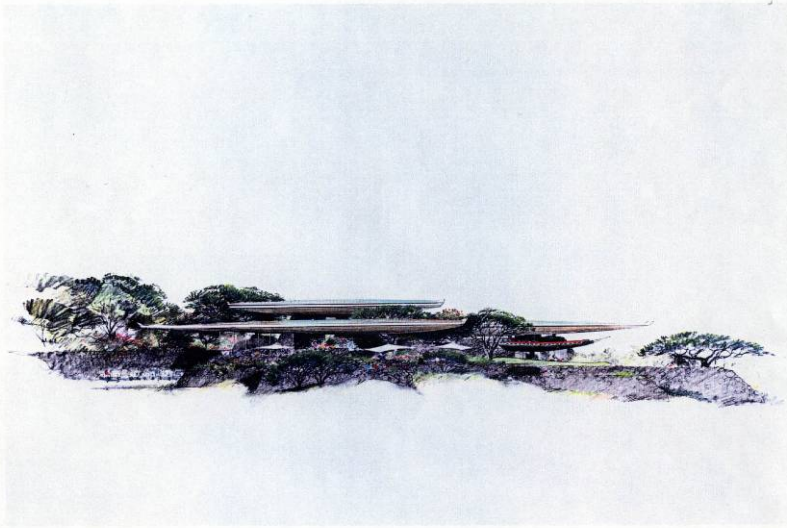
Differ on goals

No common understanding of terms

No standards

No common measurement of progress

Actions may be by consensus, but Conditions are enforced by Nature.



Planner has 3 options:

1. Ignore the environment.
2. Minimize environmental impacts
3. Use Sustainability Criteria

Can not address systems

Addresses systems attributes

Need a 4<sup>th</sup> option

4. Plan w/i systems contexts

PLACES

## Protection AND Sustainable **REQUIRE:**

1. Actions w/i Systems context
2. Systems strategy to counteract losses





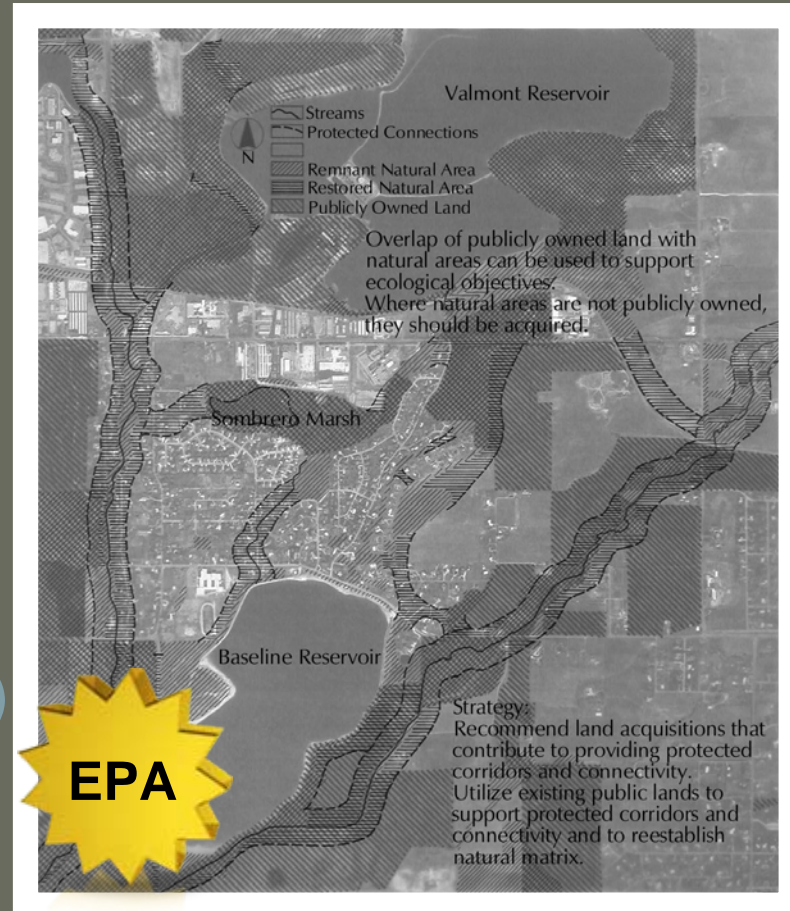
Response: **P.L.A.C.E.S.** (the tool)

## 1. Systems context

1. Functioning Ecosystems
2. Functioning Social Systems
3. Functioning Economic Systems

## 2. Systems strategy

1. Public program to renew/protect systems
2. Enables developer participation beyond site





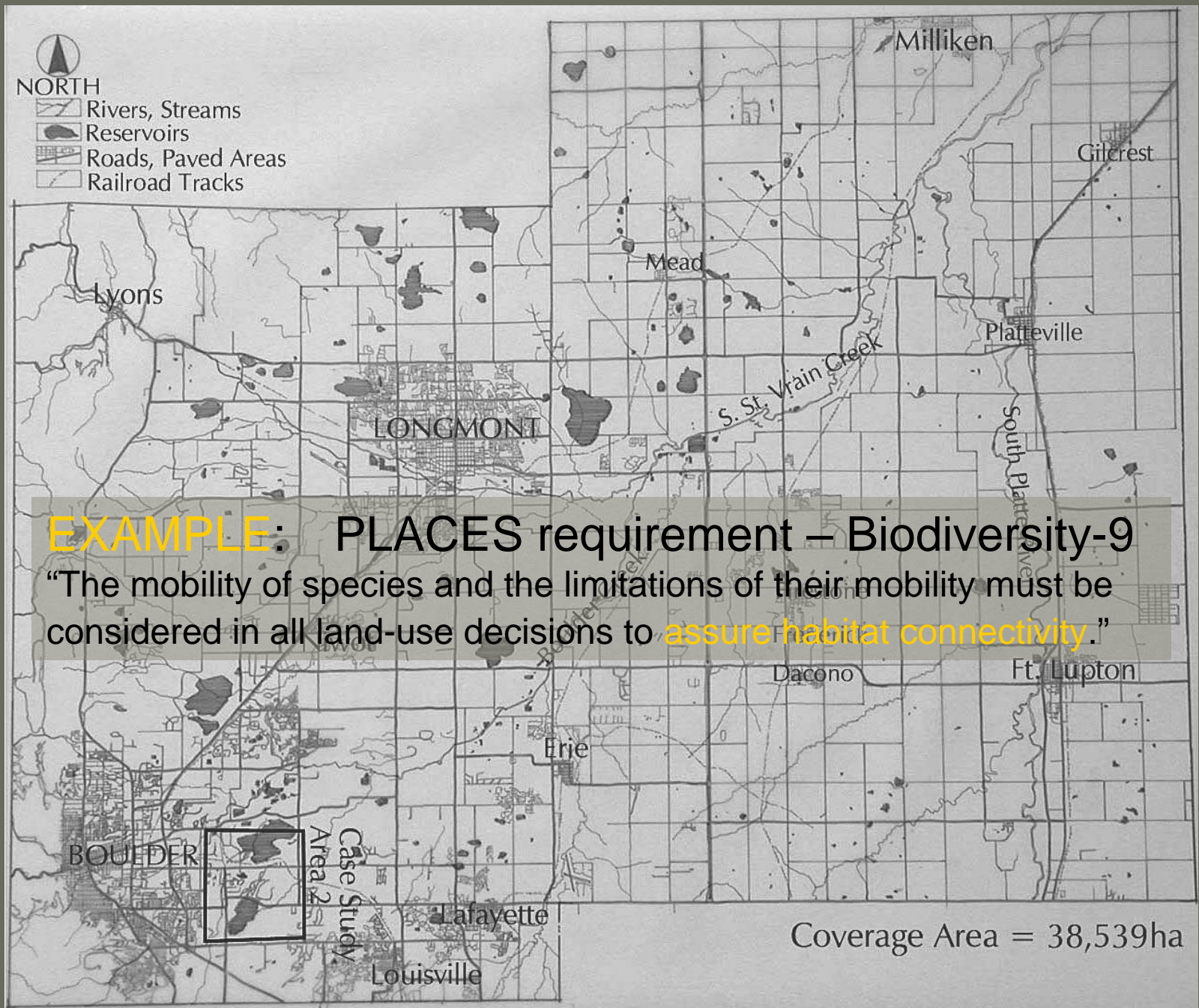
P.L.A.C.E.S. – credits communities (the audience) that minimize and counteract environmental, social, economic externalities.  
“US EPA Certificate of Sustainable Community”

by...(a) integrating natural systems into land-use decisions (level of application)

(b) enabling site users to participate in renewing natural systems (level of application)

No.	Pnts	System Component	Condition of Intact Systems	Intent	Requirement	Standard
		Natural Systems	The condition of the environment within which human life has evolved remains within human tolerances.	<p>A. The environment is clean and non-toxic to human life.</p> <p>B. Natural systems are not compromised by human activities.</p> <p>C. The complex webs of natural resources are maintained.</p>	<p>Document existing condition of the following relative to current human health standards.</p> <p>Natural productivity, Native biodiversity, Soils, Water, Air, and Atmosphere</p> <p>Present condition of and threats to regional natural productivity, native biodiversity, soils, water, air, and atmosphere are to be evaluated relative to human health standards; and a plan of action to restore/maintain these to EPA standards is created and integrated into land-use regulations and policies.</p>	
			Understanding of the human-environment relationship is enhanced.	Each of our interventions into the natural environment should become a living laboratory that furthers the science of human-environment relationships.	Land-use decisions are to be made that meet human objectives within conditions that keep natural systems intact.	
		Productivity	Maintain near-natural Nitrogen levels in soil and water	Reestablish and/or maintain near-natural biomass and productivity to the environment.	Calculate impact of proposed agriculture, land-use change, and development on soils, water, and natural productivity using 'SubLoad Model' and 'MANAGE Method'.	SubLoadmodel (xls)
		Productivity	Productive biomass of an land area is at near-natural levels.	The amount of biomass that is supported by the native landscape should remain relatively constant from year to year except as influenced by and recoverable from natural variations in climate and natural disturbance regimes.	<p>Determine the amount of natural productivity that would exist in an area without human interventions.</p> <p>Develop a regional plan that would keep natural productivity intact, utilize and manage all remnant land-uses to restore natural productivity.</p>	<p>1. 1997 UN Watercourses Conv. Art 20</p> <p>2. 1992 Convention on Biodiversity</p>
		Biodiversity, Soils Water, Air Atmosphere	see table	see table	see table	
		Social Systems	Social Systems remain intact and able to sustain and expand quality of life.	Quality of life is possible for this and all future generations.	see table	
		Economic Systems	Qualitative community resources are improved.	<p>Resources use improves the quality of life for local people beyond providing immediate and temporary income.</p> <p>When a natural resources is consumed, society should see some benefit that is worthy of the loss of any resource.</p>	<p>All resources that provide services to local citizens are documented and evaluated to determine the 7 most essential to sustain the local human population.</p> <p>A strategy is developed to result in annual increases in the quality, value, and longevity of these resources; and to develop substitutes when these resources are exhausted.</p>	








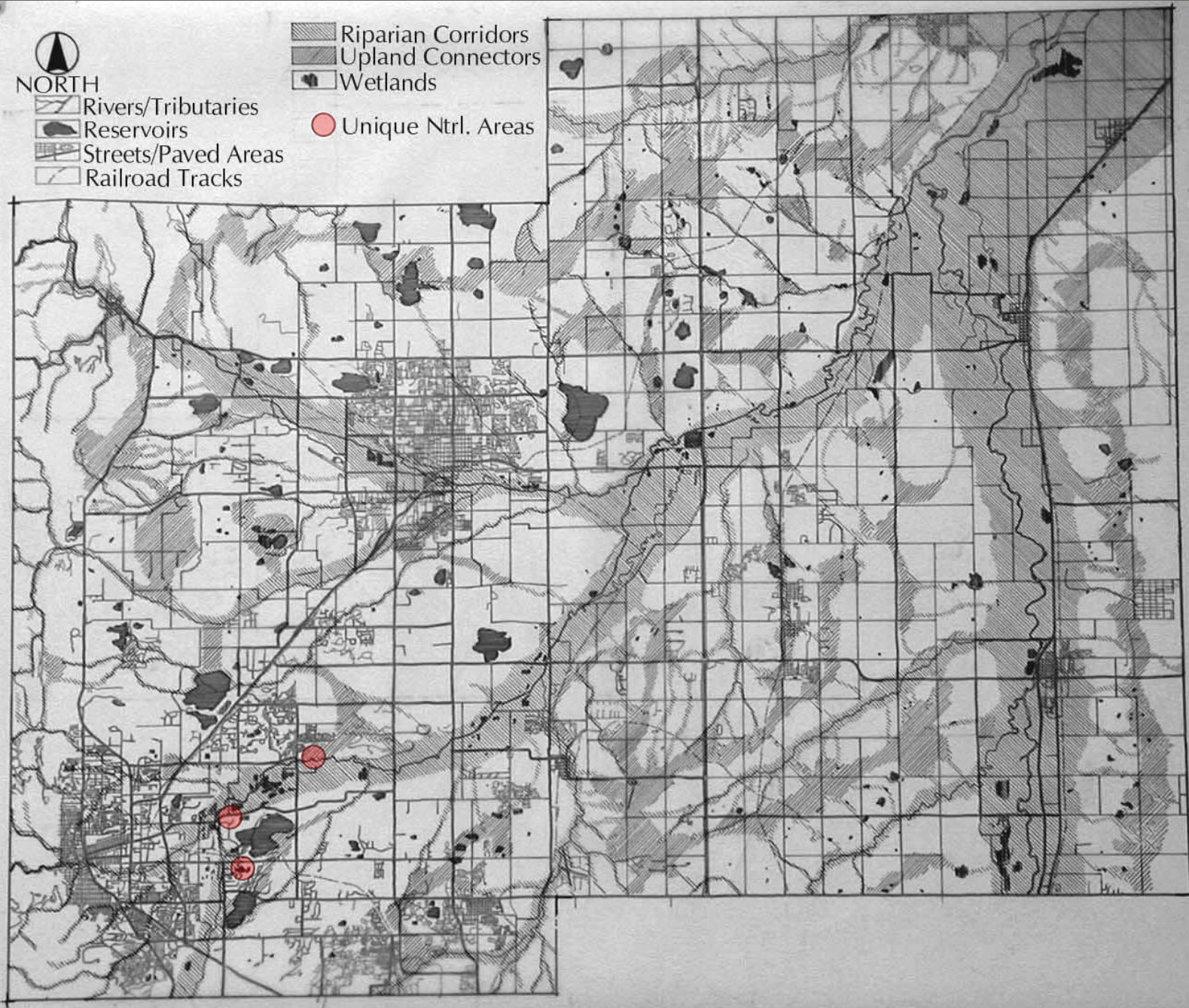


NORTH

-  Rivers/Tributaries
-  Reservoirs
-  Streets/Paved Areas
-  Railroad Tracks



-  Riparian Corridors
-  Upland Connectors
-  Wetlands

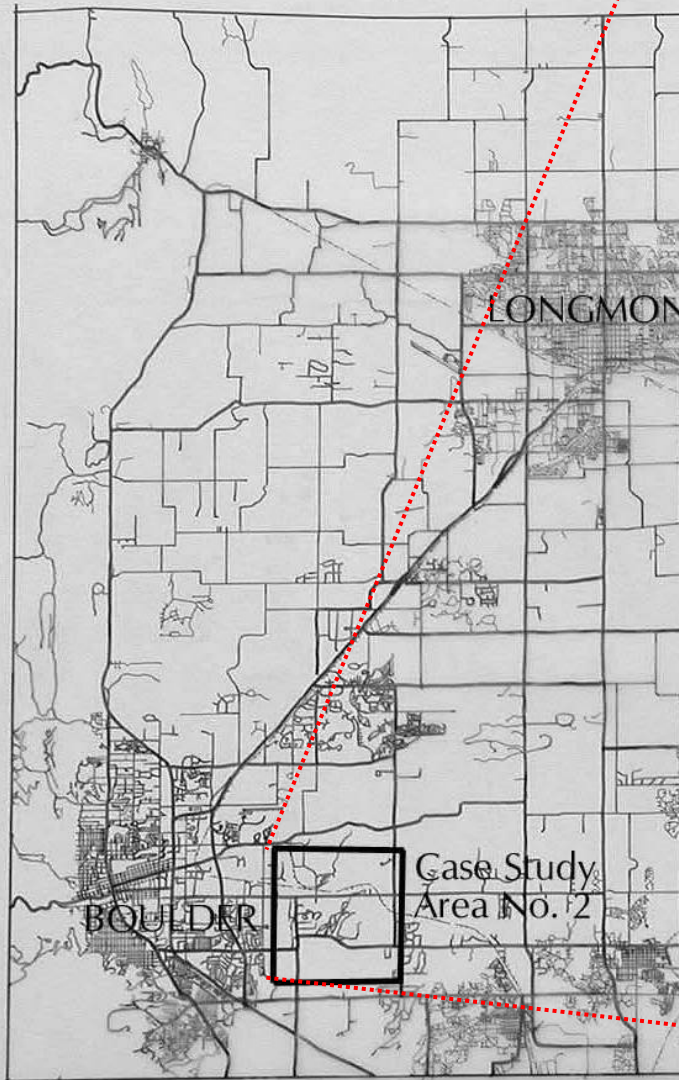
-  Unique Ntrl. Areas



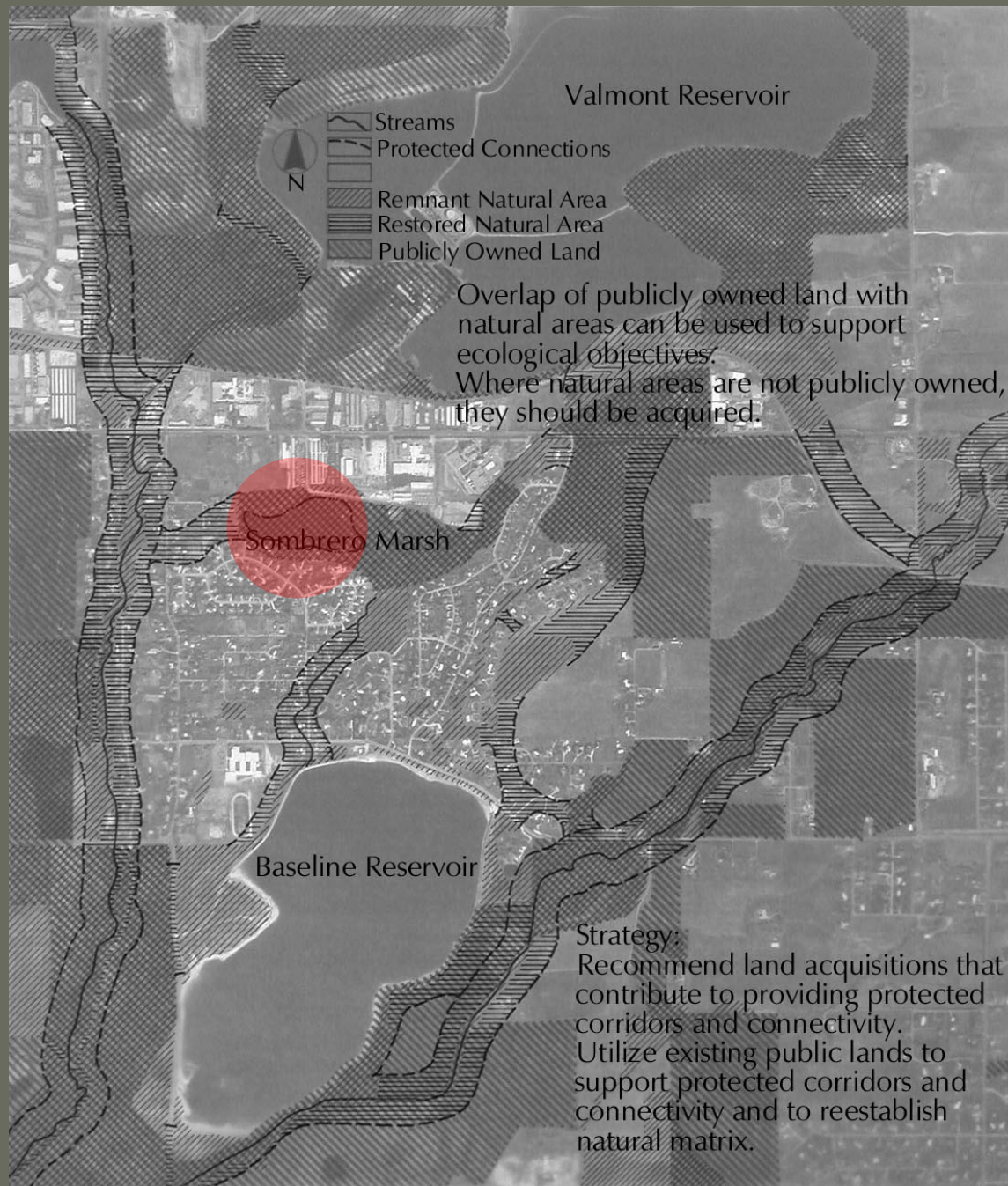




 Paved Roads etc.  
 Railroad











Aerial photograph courtesy of the City of Boulder

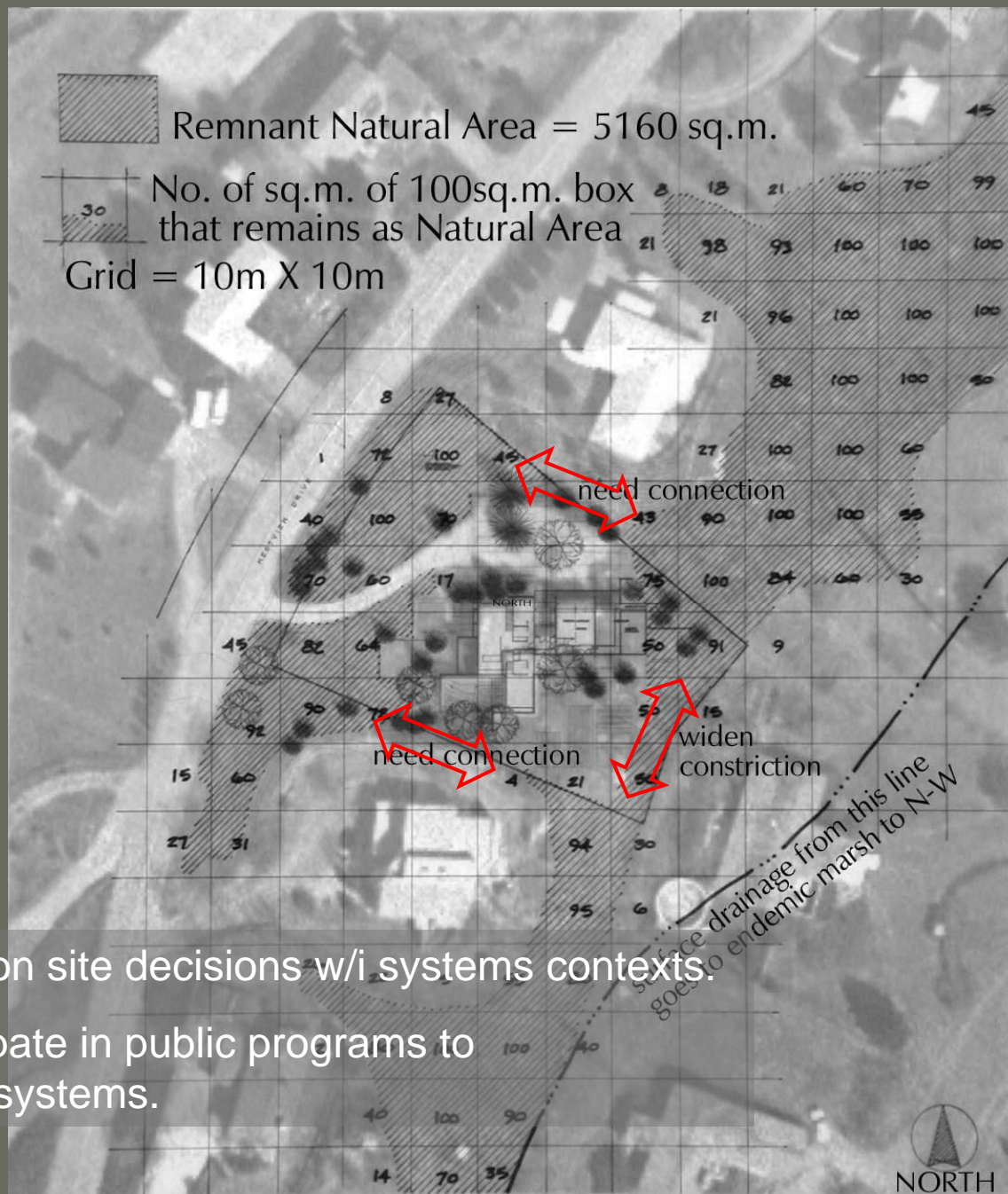


Remnant Natural Area = 5160 sq.m.



No. of sq.m. of 100sq.m. box  
that remains as Natural Area

Grid = 10m X 10m



(a). Can make on site decisions w/i systems contexts.

(b). Can participate in public programs to restore/protect systems.



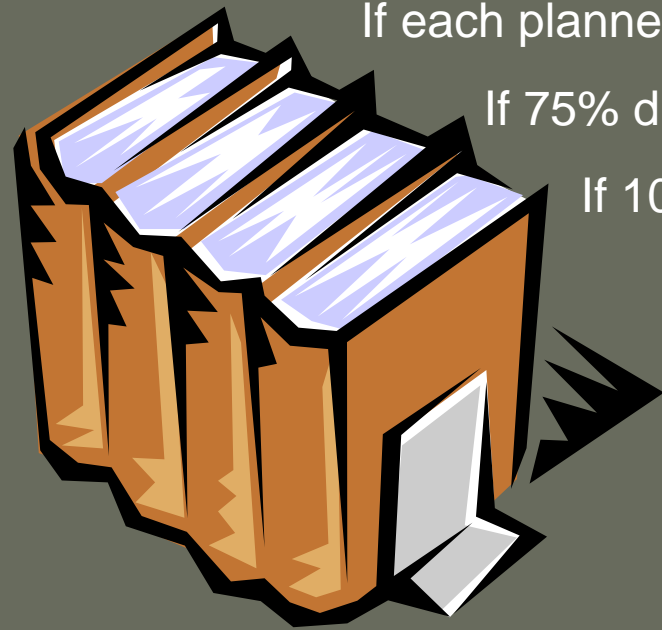
## The Power of PLACES

34,000 planners in U.S. (2006)

If each planner finds 10 responses to 50 reqs = 340,000 responses

If 75% duplicates = 85,000 unique responses (a catalogue)

If 10% apply to any site = 8500 responses/site  
(problem solved in planning – a 1x fix)



The Power of PLACES  
If PLACES had existed before development

EPA estimates 500,000 – 1 million **brownfields** in US

Assessment costs @ \$100,000/site = \$50 – \$100 billion saved

Cleanup costs (Allbusiness est. ave.) \$600,000 – \$1 million

for 500,000 sites = \$300 – \$600 billion saved

for 1 million sites = \$600 – \$1000 billion saved

(€700,000 million)



The Power of PLACES  
Residential land uses only



Building permits 2008 = 905,000 dwelling unit

Assume environmental costs @ \$100/du = **\$90,500,000 saved** (1 yr)

## The Power of PLACES



Types of land uses:

LUC

Urban or Built-up land

1100

**Residential**

**\$90,500,000 saved**

1200

Commercial

**\$?**

1300

Industrial

**\$?**

1400

Transportation, Communication, Utilities

**\$?**

1900

Open Space and Recreation

**\$?**

2000

Agriculture

**\$?**

4000

Water

**\$?**



## The Power of PLACES



Land consumption in U.S. ~ 1.2 million acres/yr (485,633 ha)

Land consumption in Colorado ~ 141,000 acres/yr (57,062 ha)

Assume 10% of land could be saved = 120,000 acres/yr (48,563 ha)

Assume external costs @ \$100,000/acre = **\$12 billion annual savings**

(€8400 million)

## SUMMARY

### PLACES (Planning Land And Communities to be Environmentally Sustainable)

Audience:	Land use regulation authority (communities in U.S.)
Levels: Administration	EPA (or Intl Gov) + Community
Program	Community
Application	Site
State of Development:	Ready for application (Neuse Watershed, NC)
International Transferability:	Respects all rights, Simple, use/add to catalogue
Conditions of Use:	EPA (or Intl Gov) \$ + administration Community <ul style="list-style-type: none"><li>- acceptance of EQs</li><li>- establish means of participation</li><li>- planning reviews</li><li>- administer renewal</li></ul>